

Attorney Docket No.: 99CON114P

REMARKS

After the present amendment, claims 1-23 remain in the present application.

Claims 11-23 have been allowed. The title of the invention has been amended as shown above. Reconsideration and allowance of outstanding claims 1-10 in view of the following remarks are requested.

A. Rejection of Claims 1-4 and 7-10 under 35 USC §102(e)

The Examiner has rejected claims 1-4 and 7-10 under 35 USC §102(e) as being anticipated by U.S. Patent Number 6,271,127 B1 to Liu, et al. ("Liu"). Since in Section B of this Response Applicants disqualify Liu under 35 USC §103, the rejection of claims 1-4 and 7-10 under 35 USC §102 must be withdrawn unless each and every element of independent claim 1 is expressly disclosed in Liu.

By way of background, embodiments according to the present invention relate to a method for selective fabrication of high capacitance density areas in a low dielectric constant material. The present invention resolves a need in the art for a methodology of achieving high density capacitors for the analog areas of a semiconductor die while simultaneously achieving a low capacitance digital area on the same semiconductor die.

Claim 1 of the present invention recites "covering a first area in a dielectric, said dielectric having a first dielectric constant," and "exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant." As taught in the present

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application, a first area of a dielectric is covered, for example, with photoresist, to prevent the first area of the dielectric from being exposed to a dielectric conversion source while a second area of the same dielectric is exposed to a dielectric conversion source. The dielectric conversion source might comprise, for example, E-beams or I-beams.

Due to the exposure to the dielectric conversion source, the second area of the dielectric, which initially had a first dielectric constant, now has a second dielectric constant. The second dielectric constant is greater than the first dielectric constant. However, the dielectric constant of the unexposed first area of the dielectric remains substantially unchanged due to the fact that it was covered and therefore unexposed. Thus, the dielectric conversion source causes the dielectric constant of the second area of the dielectric to be converted from an initial dielectric constant to a higher dielectric constant.

Advantageously, by converting the dielectric constant of a second area of a dielectric to a higher dielectric constant, the present invention achieves an increase in capacitance in the second area of the dielectric, while a covered first area of the dielectric remains at a relatively low capacitance. Consequently, the present invention advantageously achieves a low capacitance area of a dielectric (for use in digital circuits) adjacent to a higher capacitance area of the dielectric (for use in analog circuits requiring a high capacitance density).

In contrast to the present invention as defined by independent claim 1, Liu is directed to curing methods. Liu does not teach, disclose, or even suggest "covering a first

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area in a dielectric, said dielectric having a first dielectric constant," and "exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant".

Liu merely discloses depositing low dielectric constant material layer 52 over substrate 48 and curing low dielectric constant material layer 52 such that hard mask or etch stop 53 is formed in the topmost layer of low-k material layer 52. See, for example, column 6, lines 36-54 and Figures 4b and 4c of Liu.

The Examiner asserts that Liu, column 7, line 67 through column 8, line 40 teaches "exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant". However, column 7, line 67 through column 8, line 40 of Liu teaches depositing a material having a low dielectric constant on a substrate. Liu then teaches curing the layer with electron beam 204 or ion implantation 206. However, Liu fails to teach, disclose, or even suggest covering a first area of a dielectric having a first dielectric constant and exposing a second area of the dielectric to a dielectric conversion source such that the dielectric constant of the second area is increased from the first dielectric constant to a second dielectric constant.

Without the covering step of the present invention, the dielectric constant of both the first area and the second area would be increased. Indeed, Liu does not even teach increasing a dielectric constant of any part or area of a dielectric. Therefore, Liu does

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not disclose, teach, or suggest the present invention as defined by independent claim 1, nor does Liu achieve some of the advantages of the present invention.

For the foregoing reasons, Applicants respectfully submit that the present invention as defined by independent claim 1 is not taught, disclosed, or suggested by Liu. Thus, independent claim 1 is patentably distinguishable over Liu. As such, the claims depending from independent claim 1 are, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

B. Rejection of Claims 5 and 6 under 35 USC §103(a)

The Examiner has rejected claim 5 under 35 USC §103(a) as being obvious with respect to Liu in view of U.S. Patent Number 6,042,994 to Yang, et al. ("Yang"). The Examiner has rejected claim 6 under 35 USC §103(a) as being obvious with respect to Liu in view of U.S. Patent Number 6,277,732 B1 to Lou, et al. ("Lou"). Applicants respectfully submit that the present invention, as defined by claims 5 and 6, is patentably distinguishable over Liu, Yang, and Lou. In any event, Applicants can disqualify, and do disqualify, Liu under 35 USC §103(c).

Under 35 U.S.C. §103(c), "[s]ubject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same

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person or subject to an obligation of assignment to the same person.” (Emphasis added.)

In the present application, Liu has been cited under 35 USC §103.

The present application, i.e. U.S. Application Number 09/575,055 filed on May 19, 2000, and Liu were, at the time the invention of the present application was made, owned by Conexant Systems, Inc. To evidence this ownership, reference is made to Exhibit A which is a true and correct copy of Pages 1-2 of the “Notice of Recordation of Assignment Document” in the present application (Application Number 09/575,055). Pages 1-2 of the “Notice of Recordation of Assignment Document” evidence assignment to Conexant Systems, Inc. at the time the present application (Application Number 09/575,055) was filed. Further, based on the bibliographic data of Liu (appearing on the first page of patent number 6,271,127 to Liu), it is apparent that Liu was filed on June 10, 1999 and was assigned to Conexant Systems, Inc.

Thus, as evidenced from Exhibit A and the bibliographic data of Liu, Conexant Systems, Inc. was the assignee of both the present application and Liu, at the time the present invention was made. For these reasons, Applicants respectfully submit that Liu is disqualified as prior art under the provisions of 35 U.S.C. §103(c). Accordingly, Applicants respectfully submit that the rejections of claims 5 and 6 under 35 U.S.C. §103(a) as being obvious with respect to Liu has been overcome and that, therefore, claims 5 and 6 should now be allowed.

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C. Conclusion

Based on the foregoing reasons, the present invention, as defined by independent claim 1, and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, outstanding claims 1-10 are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of outstanding claims 1-10 and an early Notice of Allowance directed to all claims 1-23 remaining in the present application are respectfully requested.

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Respectfully Submitted,
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Date: 6/25/04



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EXHIBIT A



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Exhibit A - Page 1

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